

FACT SHEET FOR NPDES PERMIT NO. WA0037095
PACIFIC BEACH WASTEWATER TREATMENT PLANT

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the state of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION

Applicant:	Grays Harbor County
Facility Name and Address:	Pacific Beach Wastewater Treatment Plant Pacific Beach, WA 98571
Type of Treatment:	Activated Sludge (Oxidation Ditch) w/dischARGE to a created wetland
Discharge Location:	Waterbody name: Tributary to Joe Creek Latitude: Latitude: 47° 12' 39" N. Longitude: 124° 11' 20" W.
Water Body ID Number:	WA-21-0010

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The Pacific Beach/Moclips area lying along the Northwest coast of Grays Harbor County is primarily a recreation area with service-type facilities, state park, a small naval retreat facility, and a limited forest products industry. The area currently has a permanent population of approximately 570. Only about 130 of the residences are connected to the existing sewerage system. Maximum summer population in the proposed service area is about 1,700 permanent people (population equivalent). By the year 2015, the residential population is expected to increase to 790, and the summer equivalent population of 2,360. The Pacific Ocean beach area along with islands in this area was designated as the Copalis National Wildlife Refuge

The original collection system was installed in 1924 to provide service to Sewer Improvement District No. 5 of Grays Harbor County. In 1958, Pump Station No. 1, located at intersection of Fourth and Beach Streets, was added, the wastewater treatment plant was constructed, the collection system was extended to serve the U. S. Navy facilities, and Pump Station No.2 was constructed to serve Pacific Beach State Park.

The existing gravity collection system, excluding the Navy sewers, was replaced in 1985 to reduce extraneous infiltration and inflow. In 1986, two pump stations were added to the system primarily to serve two outlying resorts. The Otis Avenue Pump Station (OA P.S.) located in Moclips to serve Ocean Crest Resort as well as the Moclips Grocery Store and one Moclips residence. A pump station at the resort pumps into the force main. The OA P.S. force main connects to the force main from P.S. No. 1. The Ocean Grove Pump Station (OG P.S.) provides service for the Sandpiper Resort. The OG P.S. force main joins the force mains from P.S. No. 1 and OA P.S. and conveys the flow from the entire area to the treatment plant.

The existing treatment plant was initially constructed in 1958 and renovated in 1985. The plant consisted of a two-cell (3.4-acre, 4.7 million gallons) facultative lagoon plus a chlorine contact chamber with dechlorination. The two cells are approximately 4.5 feet deep. A clay liner underlies the lagoon. The two cells are separated by a vertical synthetic liner. The cells operate in series. The effluent is discharged via a 12-inch pipeline to a small creek (wetland), approximately 1000 feet upstream of the confluence with Joe Creek. Sludge that accumulated in the bottom of the cells was last removed in 1985.

The lagoon is overloaded at times due to excessive I/I and unable to meet permit requirements and water quality standards. The lagoon also has problems meeting permit limits due to algae growth in the summer months and possibly short-circuiting. Because of these permit violations, the service area was placed on a moratorium on new connections by Grays Harbor County. Water quality concerns in Joe Creek, through the State Park and in the beach area caused various agency staff to require additional studies of the discharge on the receiving waters. See section titled "Description of the Receiving Water" below for results of that study. The results of the study are also reflected in the design of the treatment plant.

| The lagoon will be replaced in 1998 with an activated sludge (oxidation ditch) treatment plant and the collection system will be extended to serve areas where failing septic tanks have been identified. The failed septic tanks have created a public health emergency and have contaminated recreational shellfish areas along Pacific Beach.

See Appendix C for location area map.

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COLLECTION SYSTEM STATUS

The proposed construction project includes improvements to Pump Station No.1 and the Otis Avenue Pump Station for reliability to reduce inflow and infiltration. The collection system will be extended to serve areas where failing septic tanks were identified. The failed septic tanks have created a public health emergency and contaminated recreational shellfish areas. Phase I and part of Phase II of the new system will serve the following areas: Moclips Flats, Moclips Smithtown Area, Moclips SR 109 Highway, Roundtree Addition, Haskin Heights, Olympus Ocean Estates, and parts of Beach Lane and Lower Ocean Crest. The completion of Phase II and Phase III include Pacific Center, Annalyde Park, and the rest of Beach Lane and Lower Ocean Crest. Replacement of existing sewer mains and side laterals in Pacific Beach is being completed separately by County forces to reduce I/I flows.

TREATMENT PROCESSES

The construction of the new treatment facility will be completed in 1998. The facility is an extended aeration activated sludge (oxidation ditch) treatment plant. The WWTP consists of headworks (grinder, aerated grit chamber, and flow measurement), aeration basin, secondary clarifiers, return activated sludge (RAS) and waste activated sludge (WAS) pumping, ultraviolet disinfection, constructed wetland, post-aeration, process chlorination to control filamentous growth, in-plant pump station, process building, control building, and sludge thickener with hauling to the City of Aberdeen WWTP for further processing and disposal. The facility has an 150-kw emergency generator to maintain operation during power outages. The facility was constructed with state and federal grants and loans as well as local funds. See Appendix C for plant layout, hydraulic profile, and flow diagram.

The facility is classified as a level II wastewater treatment plant and will require one full time operator five days per week plus some operation time on weekends and holidays. The initial staffing at startup is estimated at one operator at a Class II level and 2 operators at design (year 2015). However, it is recommended that an additional operator (at least a Class I) be available half time at startup to assist the operator on weekends, holidays and vacation times.

The projected monthly average flow for the peak wet month (2015) is 257,000 gallons per day (0.257 MGD). The total peak flow to the plant with I/I removal is approximately 0.70 MGD.

ULTRAVIOLET DISINFECTION SYSTEM

UV disinfection is a physical process that uses electromagnetic energy to prevent cells from further reproduction. UV disinfection systems consist of UV lamps within a reactor, electronic ballast, power distribution centers, system controls, and a lamp cleaning rack.

UV light at a wavelength of 253.7 nanometers (nm) has the optimum germicidal effect. For wastewater disinfection, mercury vapor lamps are used to provide the desired wavelength. These lamps are inserted into quartz sleeves and then placed into wastewater. The quartz sleeves scale from building up on the lamps and prevent the lamps from being cooled by the wastewater (UV lamps are less efficient at lower temperatures).

UV dosage is measured in units of milliwatt seconds per square centimeter (Mw-sec/cm^2) and is a function of light intensity multiplied by the time the organism is exposed. UV detectors mounted near the lamps measure the average UV intensity. Dosage is used for process control. Lamps or banks of lamps can be turned on and off to maintain a target UV dosage at varying flow rates.

The parameters that affect dosage received by the pathogens and therefore disinfection performance are:

- UV intensity

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- Exposure time (flow rate and hydraulic conditions)
- UV transmittance through the wastewater
- Wastewater suspended solids

UV systems designed to meet 200 fecal coliforms/100 mL will normally produce fecal coliform counts in the range of 5 to 20/100 mL. An option for scheduled lamp cleaning can be based on fecal counts (i.e., when counts approach 100/100 mL, the lamps are cleaned).

The UV control and monitoring system includes the provisions for the following parameters:

- Individual lamp status and alarm
- GFI status for each UV rack with trip alarm
- UV Intensity
- UV intensity low warning

In the event of failure or interruption of operation of the UV control and monitoring system each power distribution center shall operate and provide the designed disinfection performance. The UV control and monitoring system is provided with a display screen and message center that allows complete operator interface. Operator interface is menu driven with automatic fault message windows appearing upon alarm conditions. During times that the facility is not manned (i.e., evenings and weekends), all alarms are telemetered to the on-duty treatment plant staff person.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility to a created wetland (the former 3.4 acre treatment lagoon) and then through a post aeration facility into an existing wetland via 12 inch pipe. This existing wetland is dependent on the existing discharge flows during low flow periods in the tributary area to Joe Creek (1000 feet upstream of confluence).

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local landfill. Solids removed from the secondary clarifier are thickened and hauled to the City of Aberdeen's WWTP for further processing. Processed biosolids (anaerobic digester) from Aberdeen WWTP is disposed of by a licensed contract hauler and land applied under a permit from the local county health district.

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PERMIT STATUS

The previous permit for this facility was issued on January 30, 1985. The permit has been administratively extended to February 28, 2000. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, and Total Available (Residual) Chlorine.

An application for permit for the new facility was submitted to the Department on March 27, 1998, and accepted by the Department on March 28, 1998.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The existing lagoon facility received its last compliance inspection without sampling on September 19, 1997.

During the history of the existing lagoon and the previous permit, the Permittee has not remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. Since this facility is being replaced, the operational and maintenance data (DMR and annual loading information) for the new facility will be reviewed yearly for the term of the permit to ascertain ongoing performance. The new facility will be monitored for the first year of operation to determine if the facility design, equipment, construction, operation, and effluent limits will meet the Department's standards. This One-Year Certification period is required through the Centennial Clean Water Fund Grant Program.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the monthly Discharge Monitoring Reports (DMRs) for the existing characteristics. These characteristics are based on the 95th percentile analysis of 24-months of DMR data (May 1995 through April 1997). The proposed characteristics are based on the approved Engineering Report (dated March 15, 1996). The monthly average effluent is characterized as follows:

Table 1: Wastewater Characterization

<u>Parameter</u>	<u>Existing Characterization</u>	<u>Proposed Characterization</u>	
	(Interim Limits)	<u>May/October</u>	<u>November/April</u>
FLOW	0.219 MGD	0.26 MGD	0.26 MGD
BOD5	46 mg/L	12 mg/L, 24 lbs/day	20 mg/L, 43 lbs/day
TSS	90 mg/L	12 mg/L, 24 lbs/day	20 mg/L, 43 lbs/day
Fecal Coliform	200/100 mL	200/100 mL	200/100 mL
Chlorine Residual	0.006 mg/L	N/A (UV disinfection)	N/A (UV disinfection)
Dissolved Oxygen	N/A	8.0 mg/L	2.0 mg/L
NH3-N	N/A	1.0 mg/L	10.0 mg/L

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by 10/20/2003

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regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis and the limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department of Ecology (Department) does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department.

INTERIM LIMITATIONS

In accordance with WAC 173-220-140, Schedules of Compliance, the WWTP shall be issued interim effluent limitations during the construction and startup of the new facility. These limitations are based on the treatment performance the WWTP achieved over a twenty four month period between May 1995 through April 1997. The following interim effluent limitations for BOD5 and TSS shall apply until September 1, 1998:

INTERIM EFFLUENT LIMITATIONS

Parameter	Average Monthly	Average Weekly
Biochemical Oxygen Demand ^a (5 day)	46 mg/L, 24 lbs/day	69 mg/L, 31 lbs/day
Total Suspended Solids ^b	90 mg/L, 59 lbs/day	110 mg/L, 63 lbs/day
Total Residual Chlorine	maximum 0.006 mg/L	
Fecal Coliform Bacteria	200/100 mL	400/100 mL
pH ^c	Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.	

^aThe average monthly effluent concentration for BOD5 shall not exceed 45 mg/L or 15 percent of the monthly average influent concentrations, whichever is more.

^bThere is no average monthly effluent percent removal requirement for Total Suspended Solids

FINAL EFFLUENT LIMITATIONS

In accordance with WAC 173-201A-030 (1), "Class AA (extraordinary)," and WAC 173-220-130, "Effluent limitations, water quality standards, and other requirements for permits," the WWTP shall be issued final effluent based on the Total Maximum Daily Load (TMDL) study. See sections titled "Antidegradation" and "Description of the Receiving Water" below for description of TMDL study results. The following final effluent limitations shall apply for the remainder of the permit term:

May Through October

FINAL EFFLUENT LIMITATIONS

Parameter	Average Monthly	Average Weekly
10/20/2003		

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Biochemical Oxygen Demand ^a (5 day)	12 mg/L, 24 lbs/day	15 mg/L, 30 lbs/day
Total Suspended Solids ^a	12 mg/L, 24 lbs/day	16 mg/L, 32 lbs/day
Fecal Coliform Bacteria	200/100 mL	400/100 mL
pH ^c	Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.	
Total Ammonia (as NH ₃ -N)	1.0 mg/L	
Dissolved Oxygen	N/A	8.0 mg/L

November Through April

FINAL EFFLUENT LIMITATIONS

Parameter	Average Monthly	Average Weekly
Biochemical Oxygen Demand ^b (5 day)	20 mg/L, 64.3 lbs/day	25 mg/L, 54 lbs/day
Total Suspended Solids ^b	20 mg/L, 32.1 lbs/day	25 mg/L, 54 lbs/day
Fecal Coliform Bacteria	200/100 mL	400/100 mL
Total Ammonia (as NH ₃ -N)	10 mg/L	
Dissolved Oxygen	N/A	2.0 mg/L
pH ^b	Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.	

^aThe average monthly effluent concentration for BOD5 and Total Suspended Solids shall not exceed 12 mg/L or 15 percent of the respective monthly average influent concentrations, whichever is more stringent.

^bThe average monthly effluent concentration for BOD5 and Total Suspended Solids shall not exceed 20 mg/L or 15 percent of the respective monthly average influent concentrations, whichever is more stringent.

SCHEDULE FOR MEETING FINAL EFFLUENT LIMITATIONS

The Department has determined that a schedule will be required to ensure final compliance with the Water Quality-based effluent limits in the shortest practicable time. Meeting the final effluent limits will require the Permittee to complete construction for the necessary treatment capability. Therefore, the Department has included the following schedule for compliance with the final effluent limitations:

<u>Item</u>	<u>Completion Date</u>
Start Construction.....	June 24, 1997
Progress Report (50%).....	February 1, 1998
Completion of Construction.....	September 1, 1998
One-Year Certification Report.....	September 1, 1999

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from approved engineering report prepared by CH2M-Hill and are as follows:

Table 2: Design Standards for Pacific Beach WWTP.

Parameter	Design Quantity
Monthly average flow (max. Wet month)	0.257 MGD
Monthly average flow (max dry month)	0.237 MGD
Instantaneous peak flow	0.700 MGD
BOD ₅ influent loading	454 lb./day
TSS influent loading	478 lb./day
Design population equivalent	2,357

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The existing permit has a chlorine limit of 0.002 mg/L and the facility is able to comply with it by dechlorination of the effluent. However, the effluent from the proposed facility will receive UV disinfection; therefore, the permit will not include the same limit.

The effluent is water quality limited (see section titled “Consideration of Surface Water Quality-Based Limits for Numeric Criteria”); therefore, technology-based mass limits (based on WAC 173-220-130(3)(b) and 173-221-030(11)(b)) will not be applied. The following are the water quality-based limitation:

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Monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly design flow (0.24 MGD) x Concentration limit (12 mg/L) x 8.34 (conversion factor) = mass limit 24.0 lb./day.

The weekly average effluent mass loading is calculated the maximum monthly design flow (0.24 MGD) x Concentration limit (15 mg/L) x 8.34 (conversion factor) = mass limit 30.0 lb./day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the state Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

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In 1994, the Department completed a Total Maximum Daily Load (TMDL) study for the water quality parameter, dissolved oxygen. It was because of this study that the addition of post aeration and utilization of a created wetland and the existing outfall discharging to the existing wetland became important.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

DESCRIPTION OF THE RECEIVING WATER

Joe Creek is a Class AA waterbody draining into the Pacific Ocean approximately 2 miles downstream of the confluence with the WWTP tributary. Joe Creek is classified as a Type 1 salmon spawning stream that supports runs of native coho and chum salmon, and steelhead and cutthroat trout. Juvenile salmonids of several species are likely to use lower Joe Creek in the low-flow months of late summer as a rearing area. Pacific Beach State Park, located at the mouth of Joe Creek, is an important recreational shellfish harvest area, as are the adjacent beaches.

Joe Creek drains an area approximately 23 square miles. Joe Creek is a moderate - to low-gradient stream throughout its entire length. The lower 4 miles contain long, slow moving pools interspersed with short riffle areas. Flows range from less than 15 cfs during summer to greater than 100 cfs in winter. The 7Q10 low flow has not been established but is estimated to be 6.7 to 8.9 cfs. During critical periods, velocities of the freshwater lens may be less than 0.1 feet per second (fps), while the saline lens is believed to have no water movement.

Lower Joe Creek is a stratified estuary with a saline mass overlain by a freshwater lens which flows constantly seaward. Saline water circulation, however, is restricted by a shallow sill at the mouth of the estuary. During periods of lower low tides (low neap tides), the Joe Creek estuary appears to behave like a stratified lake, with poor flushing and pollutant trapping characteristics.

| The facility discharges to *a created wetland then to a tributary to Joe Creek (natural wetland)* which is designated as a Class AA (freshwater) receiving water in the vicinity of the outfall. Characteristic uses include the following:

Water supply (domestic, industrial, agricultural); stock watering; fish migration; fish spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are Class AA Freshwater Standards summarized below:

Fecal Coliforms	50 organisms/100 mL maximum geometric mean
Dissolved Oxygen	9.5 mg/L minimum

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Temperature	16 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

The results of the water quality study, completed by the Department in June 1995, required more stringent limits in the permit to protect the beneficial uses in Joe Creek. Studies conducted by CH2M Hill and the Department concluded that water quality standards for dissolved oxygen (DO) for both marine and fresh water were violated. Parameters studied included: flow, velocity, DO, temperature, conductivity, salinity, BOD5, ammonia, TSS, and fecal coliform. Limited circulation, lengthy residence times of the saline water mass, and WWTP effluent likely contribute to low DO levels in both masses. The relative contributions of municipal effluent and naturally occurring constituents in lowering Joe Creek DO levels are unknown. The water quality standard for DO in marine waters prohibits a human-caused DO sag of more than 0.2 mg/L if natural conditions depress DO near or below 7.0 mg/L (WAC 173-201A-030 (1)(ii)(B)). Since natural conditions in the Joe Creek estuary causes DO levels to fall below 7.0 mg/L, effluent from the WWTP should not be allowed to decrease DO by more than 0.2 mg/L.

The critical periods during neap tides and low flow periods may occur about five times per year. These occurrences can last from one to ten days. This appears to be critical time for the receiving water with respect to BOD loading and its effect on DO levels.

The original proposed outfall location for the new facility was at the Ocean Beach Road bridge over Joe Creek near the confluence with the tributary. Travel time of freshwater from the bridge to the Pacific Ocean might be 0.5 to 1.5 days. The selected outfall location into the ponded area (natural wetland) provides a hydraulic retention time of about 1 to 5 days. This additional time will provide some level of treatment to the effluent before it reaches Joe Creek. The recommendations from the study are:

1. The proposed WWTP upgrade must produce a high quality effluent;
2. Receiving water study be conducted when WWTP discharge approaches design loadings; and
3. *Investigate sewage seep observed immediately upstream of Pacific Beach State Park.*

The Department of Health also required additional retention time for the effluent due to a potential failure of the disinfection system and contamination of the ocean beaches shellfish areas. The utilization of the existing lagoon as a created wetland was the solution to the required retention time. Therefore, the shellfish closure area would be minimized if the disinfection system should fail.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A discharge to the created and existing wetlands is therefore authorized in accordance with Chapter 173-201A WAC.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field

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pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The proposed treatment plant as described in the above section titled " Treatment Processes" has been determined to be more protective of the receiving water. The extended aeration facility operated to remove nutrients, re-aeration of effluent, discharge to a created wetland followed by discharge to an existing natural wetland, and UV disinfection is required to protect the receiving water quality.

The critical condition for Joe Creek is the seven day average low river flow with a recurrence interval of ten years (7Q10). Ambient data at critical conditions in the vicinity of the originally proposed outfall to Joe Creek at the SR 9 Bridge was taken from the TMDL study. This study considered both historical data and an intensive monitoring study conducted in August-October 1994. The ambient background data used for this permit are taken from the Final TMDL Study for Joe Creek, dated 1995 which includes the following:

Parameter	Value used
7Q10 low flow	4.0 cfs
Velocity	0.20 ft/sec
Depth	8.0 feet
Width	58 feet
Roughness (Manning)	n=0.030
Slope	3.00 E-06
Temperature	15° C
pH (high)	7.0
Dissolved Oxygen	4.4 to 0.1 mg/L
Total Ammonia-N	0.07 mg/L
Conductivity (umho/cm)	700 to 28,300 at 0.5 to 5.0 feet depth, respectively
Salinity	0.5 to 23.9 ppt at 0.5 to 5.0 feet depth, respectively

BOD₅--Under critical conditions there was a prediction of a violation of the dissolved oxygen criterion for the receiving water. A BOD₅ effluent limit of 12 mg/L, average monthly limit, and 15 mg/L, average weekly limit, was found to be protective of the dissolved oxygen criterion and therefore was imposed instead of the technology-based limitation. The Environmental Investigation and Laboratory Services Program of the Department completed a Total Maximum Daily Load (TMDL) study of Joe Creek in 1995 (Joe Creek Receiving Water Survey) that restricts the discharge from the Pacific Beach WWTP.

BOD₅ loadings that would have been discharged from the originally proposed outfall into Joe Creek were determined to be a major factor in projected dissolved oxygen depletion in Joe Creek. The proposed effluent loading would have used up all the of the estimated assimilative capacity of the receiving water.

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Because no investigation was made of other sources (i.e., sediment oxygen demand) that would cause depletion of DO, it became apparent that utilization of the existing outfall was the preferable option.

Some natural wetlands operate with high levels of dissolved oxygen, others at low levels. Treatment wetlands that receive enough BOD and NOD loading drive the DO level down to about one to two mg/L. Exceptions are relatively large wetlands receiving clean effluents. The proposed WWTP discharges low concentrations of BOD into constructed and natural wetlands with a total of approximately 7.5 days detention time. Because of the possibility of low DO effluent from the constructed wetland, re-aeration of the flow is proposed.

The impact of BOD on the receiving water was modeled using Streeter Phelps, at critical condition and with the water quality-based effluent limitation for BOD₅ described under "Technology-Based Effluent Limitations" above. The calculations used to determine dissolved oxygen impacts are shown in Appendix C.

Temperature and pH--The effluent from the facility discharges to the created wetland. The created wetland discharge is post aerated prior to discharge to the existing natural wetland. The natural wetland discharge is the tributary creek to Joe Creek.

Because the effluent from the WWTP is discharged into a constructed wetland then to an existing natural wetland, any effect of temperature and pH on Joe Creek would be minimal. Wetlands exiting water temperatures are approximately equal to the mean daily air temperature. This represents a balance between the dominate transfers: incoming solar energy gains and evaporative energy losses. The adjustment of the incoming water temperature to this balance is rapid, because of the high energy content of evaporated water relative to typical water flow rates. Constructed and natural wetlands operate at circumneutral pH for effluents that are not strong acids or bases.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitations for temperature and pH was placed in the permit and temperature was not limited.

Fecal Coliform-- The Washington State Department of Health, Shellfish Program, required the County to include a detention facility to provide additional residence time for pathogen dieoff. This facility was required to provide additional protection for harvest of shellfish during failure of the disinfection system. The County proposed to modify the existing lagoon into a constructed wetland. The Departments of Health and Ecology agreed to this proposal.

Since the existing outfall was selected as the best location for discharge of WWTP effluent to protect the beneficial uses in Joe Creek, it is evident that the location of disinfection was also important. The selected ultraviolet disinfection system is designed to meet 200 fecal coliform colonies/100 mL and will normally produce fecal coliform counts in the range of 5 to 20/100 mL. Because of the concern for levels of suspended solids greater than 30 mg/L and the protection of the shellfish areas of Pacific Beach, scheduled lamp cleaning should be based on fecal counts or the UV intensity (reading in Mw-sec/cm² or percent of full intensity).

The receiving water quality standards (Class AA) requires that levels of fecal coliform colonies "shall both not exceed a geometric mean value of 50 colonies/100 mL and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 100 colonies/100 mL."

Because of the residual indicator bacteria populations in all wetlands, bacteria removal efficiency is a function of the inflow bacteria population. Wetland systems that have long residence times (greater than about 10 days) provide some disinfection. Designed vegetative wetlands appear to be more effective for

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pathogen removal than facultative ponds and other natural systems that have less physical contact between pathogens and solid surfaces.

Designed wetlands provide a hostile environment for pathogenic organisms and factors such as natural dieoff, temperature, ultraviolet light, unfavorable water chemistry, predation, and sedimentation cause pathogen populations to be reduced. Many of the processes that reduce pathogen populations in natural pond treatment systems are equally or even more effective in designed wetland systems. Fecal and total coliform measured in natural wetlands that receive no wastewater indicates levels between 100 to 450 col/100 mL. These natural bacteria populations are generally low, but they may be variable and seasonally high because of wildlife populations. Because natural sources of coliforms and fecal streptococcus bacteria are found in all wetlands open to wildlife, outflow indicator bacteria populations in treatment wetlands can never be consistently reduced to near zero unless disinfection is used.

Therefore, it is assumed that under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

Because of the sensitivity of the receiving stream and the potential of discharges of pollutants that may effect this sensitivity, a water quality study was conducted on these pollutants to determine whether or not effluent limitations would be required in this permit. The project plan for the study identified the period that critical conditions may occur and that may cause a water quality violation. The critical condition in this case occurs from May through October. The parameters used for the critical condition study in the receiving water are as follows: velocity, flow, dissolved oxygen, temperature, conductivity, salinity, BOD₅, NH₃-N, TSS, and FC bacteria.

The study focused on the dissolved oxygen concentration depletion in Joe Creek below the confluence with the tributary. The study concluded that a proposed WWTP outfall directly into Joe Creek would be a significant factor in the further depletion of DO in the stream. This factor was because of the significant increase (6 to 8 times) in the discharge of pollutants to Joe Creek as opposed to the current location in the tributary.

The study concluded that the BOD₅ loadings discharged to Joe Creek should be limited (see above section titled "Surface Water Quality Criteria". The toxics pollutant, ammonia-nitrogen, was also determined to be one of the major pollutants of concern present in the discharge. Effluent limits for ammonia-nitrogen (NH₃-N) was determined based on the water quality study (TMDL) in Joe Creek. Ammonia -nitrogen has an effect on the dissolved oxygen and a potential to cause a violation of the Water Quality Standards.

Pacific Beach is a small resort and vacation community with a limited number of commercial establishments. The effluent from the WWTP facility discharges through a created and natural wetland before discharging into Joe Creek. Any minor amount of toxic pollutants that may be present would be taken up in the wetland vegetation and soils.

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WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health,

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED January 30, 1985

Parameter	Existing Limits	Proposed Limits	
		May through October	November through April
BOD ₅ (average monthly)	30 mg/L	12 mg/L	20 mg/L
BOD ₅ (average weekly)	45 mg/L	15 mg/L	25 mg/L
TSS (average monthly)	75 mg/L	12 mg/L	20 mg/L
TSS (average weekly)	110 mg/L	16 mg/L	25 mg/L
Total Residual chlorine	0.002 mg/L	N/A	N/A
Fecal Coliform	200/100 mL	200/100 mL	200/100 mL
pH	6.0 to 9.0	(same)	(same)
NH ₃ -N (average monthly)	N/A	1.0 mg/L	10 mg/L

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DO (average weekly)	N/A	8.0 mg/L	2.0 mg/L
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MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for Activated Sludge/Oxidation Ditch (Table XIII-1B)

Additional monitoring is required to further characterize the effluent. These monitored pollutants could have a significant impact on the quality of the surface water.

Monitoring Joe Creek at the Ocean Beach Road bridge, downstream of the confluence with the discharge tributary, for dissolved oxygen, temperature, pH, hardness, fecal coliform and flow is required to further characterize the effluent. These parameters have a significant impact on the quality of the surface water. Monitoring data shall be collected for three years beginning in 1999. A summary report of the monitoring findings shall be submitted to the Department within 90 days of receipt of the final test results.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The existing laboratory at this facility is accredited for Biochemical Oxygen Demand (BOD₅), Total Residual Chlorine, Dissolved Oxygen (DO), pH, Total Suspended Solids (TSS), and Fecal Coliforms. This permit will require the facility to be accredited for: Biochemical Oxygen Demand (BOD₅), Dissolved Oxygen (DO), pH, Total Suspended Solids (TSS), Fecal Coliforms, and Ammonia-Nitrogen (NH₃-N).

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4. restricts the amount of flow.

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OPERATION AND MAINTENANCE (O&M)

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. The following wetland vegetation management program shall be included in the Operation and Maintenance Manual.

WETLAND VEGETATION MANAGEMENT PROGRAM

The success of the constructed wetland depends on the proper operation and maintenance of the wetland vegetation. Therefore, a vegetation monitoring program shall be developed and managed by the Permittee as part of the Operation and Maintenance Program. Proper maintenance and restoration (revegetation) is important to the success of the wetland facility and the removal of pollutants of concern. Studies of wetland treatment show that pollutant removal is directly related to the stem density of the wetland vegetation per acre. Yearly monitoring by the Permittee should ensure that this condition is being met.

The operation and maintenance of the facility shall include the appropriate directions and requirements for Vegetation Monitoring Program and a Vegetation Contingency Plan. The goal of the monitoring and contingency plans should be to maintain and/or replace vegetation and to provide a viable wetland. The vegetation requirements shall be included in the Operation and Maintenance (O&M) Manual as required in Section S5.D in the Permit. The O&M Manual should specify the operator training and knowledge needed to conduct the monitoring program and to specify what remedial action should be considered.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The sludge is hauled to the City of Aberdeen's WWTP for further processing. The processed sludge is then contract hauled to an existing Rabanco, Inc. site for disposal. The disposal of other solid waste is under the jurisdiction of the Grays Harbor County Health Department.

PRETREATMENT

An industrial user survey may be required to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations (40 CFR Part 403 and Sections 307(b) and 308 of the Clean Water Act), with state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC), and with local ordinances.

FEDERAL AND STATE PRETREATMENT PROGRAM REQUIREMENTS

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department has been delegated authority to administer the Pretreatment Program (i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)). Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for

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significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program (40 CFR 403.8(f)(1)(iii)), the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) (40 CFR 403.8 (f)(1)(i)).

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge (WAC 173-216-110(5)) (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit sixty days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with state water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities (40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.).

WASTEWATER PERMIT REQUIRED

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

REQUIREMENTS FOR ROUTINE IDENTIFICATION AND REPORTING OF INDUSTRIAL USERS

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system". Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a state waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a state waste discharge permit application.

ANNUAL SUBMITTAL OF LIST OF INDUSTRIAL USERS

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This provision requires the POTW to submit annually a list of existing and proposed SIUs and PSIUs. This requirement is intended to update the Department on an annual basis of the status of industrial users in the POTW's service area, without requiring the POTW to go through the process of performing a formal Industrial User Survey. This provision is normally applied to POTWs not serving industrial or commercial users. Although this permit does not require performance of an Industrial User Survey, the Permittee is nevertheless required under the previous section, to take adequate continuous routine measures to identify existing and new industrial discharges.

DUTY TO ENFORCE DISCHARGE PROHIBITIONS

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

SUPPORT BY THE DEPARTMENT FOR DEVELOPING PARTIAL PRETREATMENT PROGRAM BY POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit condition S10. requires the Permittee to conduct an inspection of the outfall into the natural wetland and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G6 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Conditions G7 relates to permit renewal. Condition G8 prohibits the reintroduction of removed substances back into the effluent. Condition G9 states that the

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Department will modify or revoke and reissue the permit to conform to more stringent toxic effluent standards or prohibitions. Condition G10 incorporates by reference all other requirements of 40 CFR 122.41 and 122.42. Condition G11 notifies the Permittee that additional monitoring requirements may be established by the Department. Condition G12 requires the payment of permit fees. Condition G13 describes the penalties for violating permit conditions.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

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1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

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1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

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1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to issue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published September 5, 1997, in the *Daily World* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) in the *Daily World* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360 407-6279), or by writing to the address listed above.

This permit and fact sheet were written by Gerald L. Anderson.

APPENDIX B--GLOSSARY

AKART-- An acronym for "all known, available, and reasonable methods of treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The average of the measured values obtained over a calendar month's time.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

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Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of rainfall-caused surface water drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington state permit writers are joint NPDES/State permits issued under both state and federal laws.

Pass through -- A discharge which exits the POTW into waters of the state in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of state water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

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Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington state water quality standards can be found on the Department's homepage at <http://www.wa.gov.ecology>.

STREETER PHELPS DISSOLVED OXYGEN MODEL

Streeter-Phelps analysis of critical dissolved oxygen sag.
Lotus File DOSAG2.WK1 Revised 19-Oct-93

INPUT

1. EFFLUENT CHARACTERISTICS

Discharge (cfs):	0.365	0.365
CBOD5 (mg/L):	10	10
NBOD (mg/L):	1.4	1.4
Dissolved Oxygen (mg/L):	0.00	0.00
Temperature (deg C):	20	20

2. RECEIVING WATER CHARACTERISTICS

Upstream Discharge (cfs):	4	4
Upstream CBOD5 (mg/L):	0.0	0.0
Upstream NBOD (mg/L):	0	0
Upstream Dissolved Oxygen (mg/L):	9.08	9.08
Upstream Temperature (deg C):	18	18
Elevation (ft NGVD):	2	2
Downstream Average Channel Slope (ft/ft):	0.000003	0.000003
Downstream Average Channel Depth (ft):	0.3	0.3
Downstream Average Channel Velocity (fps):	0.1	0.1

3. REAERATION RATE (Base e) AT 20 deg C (day⁻¹):

Reference Suggested	Applic.	Applic.	Suggested	
	Vel (fps)	Dep (ft)	Values	Values
Churchill	1.5 - 6	2 - 50	9.34	9.34
O'Connor and Dobbins	.1 - 1.5	2 - 50	24.94	24.94
Owens	.1 - 6	1 - 2	42.83	42.83
Tsivoglou-Wallace	.1 - 6	.1 - 2	0.00	0.00

4. BOD DECAY RATE (Base e) AT 20 deg C (day⁻¹):

Reference	Suggested Value	Suggested Value
Wright and McDonnell, 1979	3.33	3.33

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OUTPUT

1. INITIAL MIXED RIVER CONDITION		
CBOD5 (mg/L):	0.8	0.8
NBOD (mg/L):	0.1	0.1
Dissolved Oxygen (mg/L):	8.3	8.3
Temperature (deg C):	18.2	18.2
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)		
Reaeration (day ⁻¹):	0.09	0.22
BOD Decay (day ⁻¹):	0.21	0.21
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU		
Initial Mixed CBODU (mg/L):	1.2	1.2
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	1.3	1.3
4. INITIAL DISSOLVED OXYGEN DEFICIT		
Saturation Dissolved Oxygen (mg/L):	9.434	9.434
Initial Deficit (mg/L):	1.11	1.11
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	3.98	0.66
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):	6.52	1.07
7. CRITICAL DO DEFICIT (mg/L):	1.42	1.13
8. CRITICAL DO CONCENTRATION (mg/L):	8.01	8.31

APPENDIX D--RESPONSE TO COMMENTS

Comments received from the Department of Health, Shellfish Section, Frank Meriwether:

1. **COMMENT:**

The Monitoring Requirements (Permit Section S.2) stipulates Minimum Sampling Frequencies of once per week for TSS and Fecal Coliform. However, I believe the Monitoring Guidelines in the Permit Writer's manual recommend sampling for these parameters at least twice per week for oxidation ditches.

RESPONSE:

That is correct. Section S2. of the permit will be changed to be in agreement with Table XIII-1C of the Permit Writer's manual.

2. **COMMENT:**

There seems to be some discrepancies in the units used for UV intensity and dosage (p.7 of Permit, p.4 of Fact Sheet). UV intensity is typically given in milliwatts per square centimeter (Mw-sec/cm²). UV dosage is the product of UV intensity and the exposure time in seconds, with the resultant unit of Mw-sec/cm².

RESPONSE:

Section S2, Monitoring Requirements, should be indicated as UV dosage in mW-s/cm². Section S2 of the Permit and the first paragraph on page 4 of the Fact Sheet will be revised to be in agreement.

3. **COMMENT:**

Thank you for including the Shellfish notification clause in Section S.3 of the permit.

RESPONSE:

No response necessary.

4. **COMMENT:**

We would like to know the timelines for completion of the collection system improvements discussed on p.3 of the fact sheet. Thank you.

RESPONSE:

No response necessary. Information requested was sent to the Department of Health.

5. **COMMENT:**

Thank you for listing provisions of the UV control and monitoring system in the fact sheet (p.4).

RESPONSE:

No response necessary.

6. **COMMENT:**

Due to the relative infrequency of the fecal coliform testing, it is recommended that the UV transmittance through the wastewater be used to help determine the frequency of scheduled lamp cleaning (p.4 of fact sheet). Photoreactivation of coliform is not thought to occur at dosages greater than 30 mW-s/cm².

RESPONSE:

The following sentence was added to the third paragraph on page 4 of Fact Sheet. "Photoreactivation of coliform is not thought to occur at dosages greater than 30 Mw-sec/cm²."

The Operations and Maintenance (O&M) manual will include the monitoring of TSS, fecal coliform, and UV intensity parameters to determine when the UV lamps should be cleaned. Since TSS and fecal coliform are monitored once per week, UV intensity needs to be monitored daily as a "reading." I think that manufactures refer to a "standard" of 16 Mw-sec/cm² and your comments that 30 Mw-sec/cm² is accepted as the minimum level that prevents photoreactivation of the bacteria should be used as the initial settings for when the lamp tubes should be cleaned. The Department will require that the O&M manual include the collection of TSS, fecal coliform, and UV intensity data over the first two years of operation to determine the schedule for lamp cleaning. The Department will also require that the cleaning of UV lamps are based on the minimum UV intensity developed. These requirements will be included in permit section S5.G(5).

7. **COMMENT:**

On the last paragraph of p.11 of the fact sheet, it is not clear to us if the "ponded area (wetland)" is the constructed wetland or the natural wetland.

RESPONSE:

The wetland referred to is the natural wetland that the facility discharges to after the constructed wetland and the post aeration unit. The word "natural" was added in the parenthesis.

8. **COMMENT:**

We would like to know the incremental detention times of the systems (such as the constructed wetland, post-aeration tank, if appropriate, and the natural wetland) that accrue to the estimated total of 7.5 days (p. 13 of fact sheet).

RESPONSE:

No response necessary. Information requested was sent to the Department of Health.

Comments received from the Department of Fish and Wildlife, Mark Ostwald, Area Habitat Biologist:

COMMENT:

It is my understanding that the treatment facility is currently undergoing modifications that will make the effluent cleaner. I hope this is true as this may solve one reason there is no salmon in this stream. If there is no improvement with the effluent then the stream may remain degraded, which is unacceptable for fish resources.

If there is not going to be any improvement with effluent going into the stream, then the permit should be denied.

RESPONSE: The existing treatment facility is an non-aerated lagoon system that has exceeded permitted flow limits, and Biochemical Oxygen Demand (BOD₅ @ 30 mg/L, 15 lbs/day) and Total Suspended Solids (TSS @ 75 mg/L, 37 lbs/day) loadings and percent removal consistently over the years. That is why this facility was a high priority for replacement in 1997 and received a grant loan funding from a number of state and federal sources. The new facility is designed as an activated sludge facility with discharge to a created wetland, UV disinfection and post aeration prior to discharge to the natural wetland area of the tributary to Joe Creek. The effluent limitations are based on stringent requirements to

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protect fishery resources in Joe Creek and also shellfish resources where Joe Creek discharges to marine waters. The BOD₅ and TSS concentrations and loadings are 12 mg/L, 24 lbs/day, each prior to discharge to the created wetland where it receives additional treatment prior to aeration, UV disinfection, and discharge to the tributary.